

2009 NAIP

2009 NAIP Post-Mortem Meeting

Salt Lake City, UT

December 10, 2009

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Photo Science Office Locations



History & Background of Photo Science

- 1974 – Founded in Lexington
- Originally coal mine mapping
- 1991 – Ownership change (*13 people*)
- Today over *200* professionals... exclusively Geospatial
- Full-service Surveying, Mapping, Remote Sensing, and GIS capabilities
- Corporate Headquarters:
 - Lexington, Kentucky



Major Federal Clients

- USGS
- Forest Service
- Corps of Engineers
 - *Numerous Districts*
- NGA
- USDA
 - *NAIP*
 - *NRCS*
- NOAA
- DHS

PSI NAIP History

- 2009: Alabama, Colorado, Mississippi , North Carolina
- 2008: Indiana, Kentucky, North Carolina
- 2007: Maryland, Mississippi, Nebraska, West Virginia
- 2006: Indiana, Kentucky , Ohio
- 2005: Indiana
- 2004: Mississippi, New York, South Carolina, Tennessee, Virginia
- 2003: Arizona, New York, Pennsylvania, South Carolina

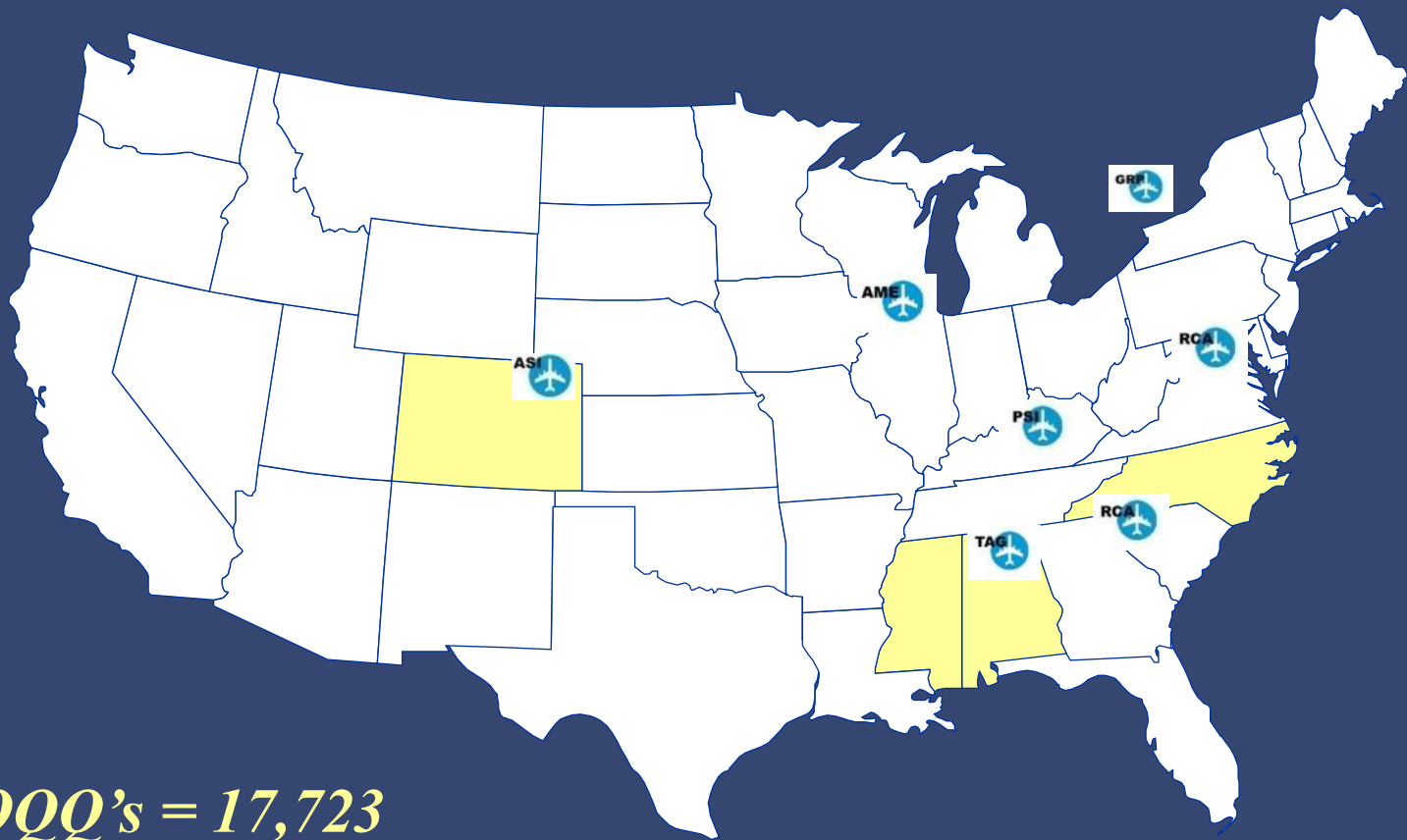
2009 PSI Team

- Photo Science (PSI) *Acquisition and DO*
- Aerometric (AME) *Acquisition and DO*
- Aerial Surveys Int'l. (ASI) *Acquisition*
- The Atlantic Group (TAG) *Acquisition*
- Richard Crouse & Associates (RCA) *Acquisition*
- Group Alta (GRP) *Acquisition*

Aerial Sensors-DMC: *All Digital*

- PSI: *3 DMC's, Three Turbines*
- AME: *1 DMC, One Turbine*
- Richard Crouse: *2 DMC's, Piston Twins*
- ASI: *2 DMC's, One Turbine and One Piston Twin*
- TAG: *1 DMC, One Turbine*
- Group Alta: *1 DMC, One Turbine*

2009 NAIP States-CO, NC, AL, MS



Total DOQQ's = 17,723

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2009 NAIP States

- Colorado

- 7,424 DOQQ's
- 4-Band
- Acquisition:
 - 6/15 – 8/15

- Alabama

- 3,481 DOQQ's
- 4 – Band
- Acquisition:
 - 6/15 – 9/15

- North Carolina

- 3581 DOQQ's
- 4 – Band
- Acquisition:
 - 6/1 – 8/31

- Mississippi

- 3,237 DOQQ's
- 3 – Band
- Acquisition:
 - 6/15 – 8/31

	June 1st 8 15 22 29				July 6th 13 20 27				Aug 3rd 10 17 27 31				Sept 7th 14 21	
Colorado														
North Carolina														
Mississippi														
Alabama														

Planning

State	Counties	Sq Miles	DOQQ's	Flight lines	FL Miles	Exposures	%
Colorado	64	107,665	7,424	342	32,872	30,331	57%
North Carolina	100	54,382	3,581	252	12,550	9,928	19%
Alabama	67	54,515	3,481	126	10,517	7,024	13%
Mississippi	82	50,792	3,237	126	9,541	6,267	12%
	313	267,354	17,723	846	65,480	53,550	

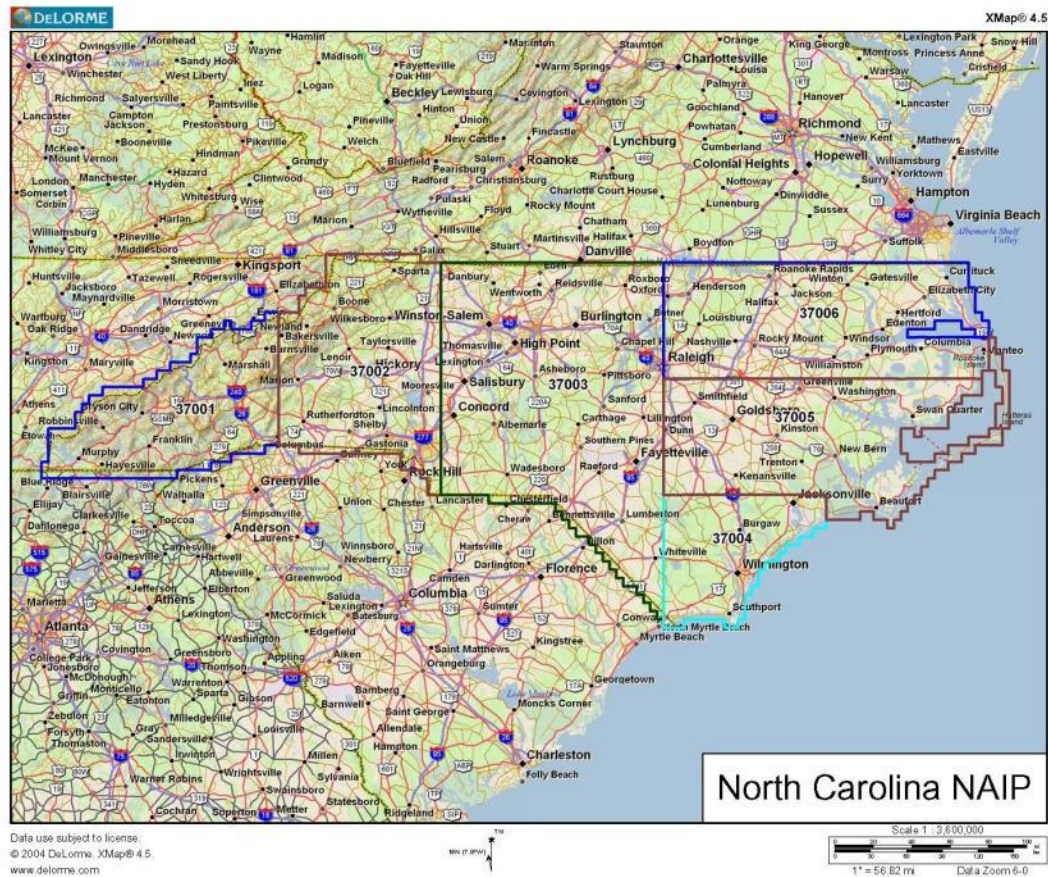
Planning



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Schedule-Flying

	Task Order	Actual
Colorado	6/15 thru 8/15	August 29
North Carolina	6/1 thru 8/31	October 19
Alabama	6/15 thru 9/15	October 18
Mississippi	6/15 thru 8/31	October 5

Field Control

- Colorado - 80 New Points
- North Carolina – 41 Existing Points
- Alabama – 29 New Points
- Mississippi- 28 Existing Points

Acquisition by Contractor

	Colorado	North Carolina	Alabama	Mississippi	Totals	
PSI	7857	3456	5374		16687	31%
AME	6504				6504	12%
ASI	15970				15970	30%
TAG		181	7917		8098	15%
RCA		5721			5721	11%
GRP		570			570	1%

DMC Image Processing

- All DMC post processing accomplished in Lexington
- This allowed monitoring of colors and tones with custom LUTs to ensure we were within the “best practice” guidelines.
- This also provided for a complete set of backup imagery in house.

ABGPS/IMU and A/T

- The majority of ABGPS/IMU data was processed in Lexington. Some subs performed their own processing and delivered the results (and raw data) to PSI.
- Any A/T needed was performed by PSI (*less than 10% of the ABGPS/IMU data required additional AT*).
- Having all data allowed PSI to identify and resolve issues in a timely manner.

Accuracy

Colorado:

Average of Squared Differences	1.33	0.93
RMSE of X and Y Individually	1.15	0.97
RMSE Horizontal (Radial)		1.50
Horizontal Accuracy (95% C.I.)		2.60

North Carolina:

Average of Squared Differences	1.15	1.53
RMSE of X and Y Individually	1.07	1.24
RMSE Horizontal (Radial)		1.64
Horizontal Accuracy (95% C.I.)		2.83

Mississippi:

Average of Squared Differences	0.53	2.38
RMSE of X and Y Individually	0.73	1.54
RMSE Horizontal (Radial)		1.70
Horizontal Accuracy (95% C.I.)		2.95

Alabama:

Average of Squared Differences	1.21	4.67
RMSE of X and Y Individually	1.10	2.16
RMSE Horizontal (Radial)		2.42
Horizontal Accuracy (95% C.I.)		4.20

Acquisition Issues

- Snow in Colorado: *released by USDA for full acquisition on 7/23*
- Weather, Weather, Weather: *30 day period in AL/MS/NC of No Flights*
- *The Unexpected:*
 - *One Contractor:*
 - *non-standard equipment!*
 - *Surprised at 28,000'*
 - *They might break,*
 - *but they don't shatter!*



Ortho Production

- Lexington preformed all rectification, mosaicing and tone matching.
- Large blocks of tiles were cut in Lexington and shipped to Aerometric for initial editing.
- Lexington did a block in Colorado, as well as the smaller areas in other States to efficiently fill holes.

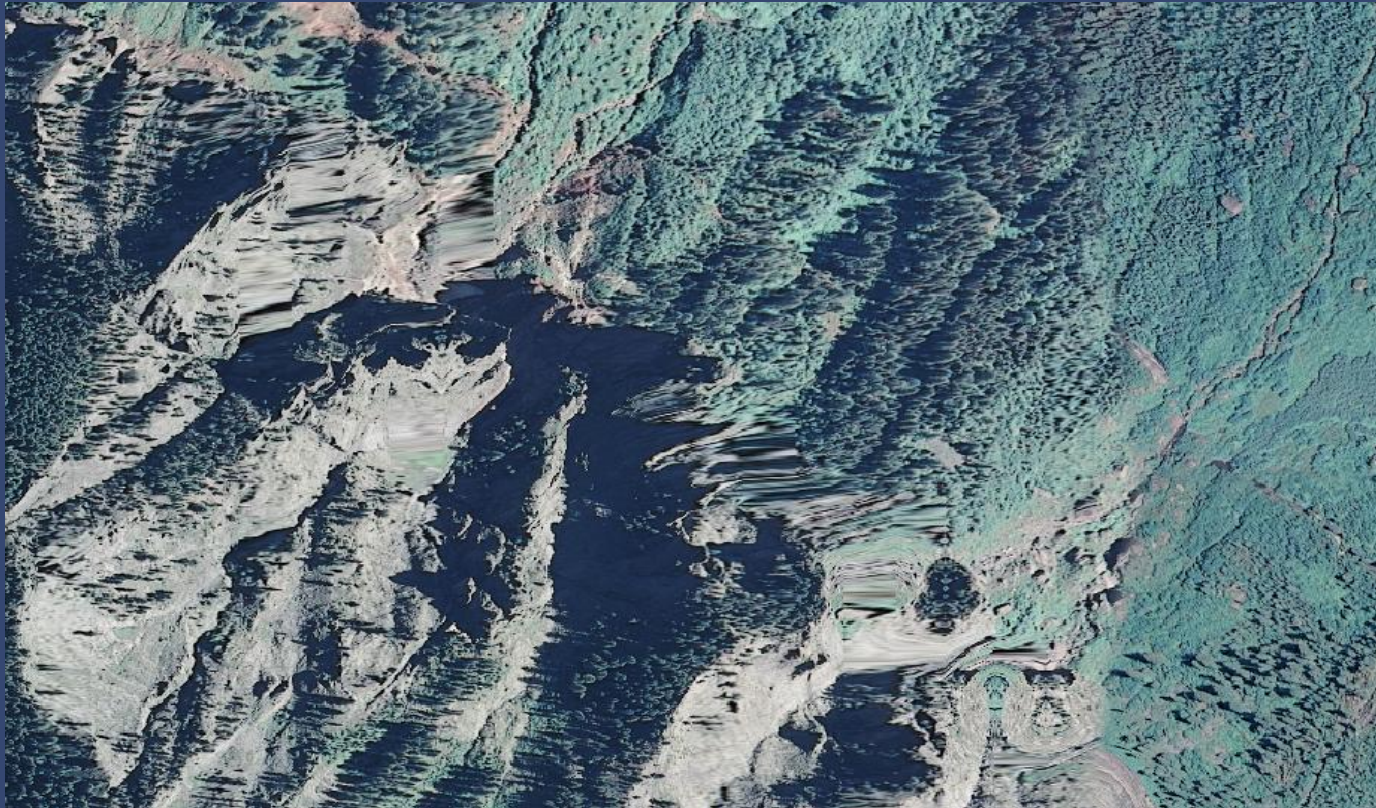
Wide range of tones to work with



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Ortho Issues

- Smears Caused by DEMs



Snow and shadows



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Final deliverables

- All final CCM's were created in Lexington
- All final DOQQ's were created in Lexington
- All final deliverables were shipped from Lexington.

Schedule-Digital Orthos

	Flight Actual	Completion
CO	8/29	9/29
NC	10/19	11/13
AL	10/18	11/13
MS	10/5	10/22

Added Capacity

- 4-DMCs
 - *Aerometric*
 - *Harden*
 - *Wilson*
- 1-100TB Storage



Photo Science Pixel Farm
616 Terrabytes - Active

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*Thank You for the
opportunity to brief you today!*

Questions?